

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
WASHINGTON

CONSTRUCTION SPECIFICATION

CS-15 EARTH FILL, CLASS S

15.1 SCOPE

The work shall consist of the construction of compacted earth fills where the amount of compaction is specified by the performance of equipment.

15.2 MATERIALS

All fill material shall be obtained from the approved excavation or borrow areas. The selection, blending, routing and disposition of materials within the embankment shall be subject to the approval of the NRCS technical representative. Fill materials shall contain no frozen material and shall be free of organic and foreign material. The maximum size of rock fragments incorporated in the earthfill liner shall be six (6) inches, provided that such rock fragments are completely imbedded in the matrix of the compacted earthfill.

15.3 FOUNDATION PREPARATION

After stripping, the foundation shall be scarified or plowed to a minimum depth of 2 inches. The foundation area shall be bonded and compacted with the first layer of earth fill by the process used to place fill. All foundation and abutment surfaces shall not be steeper than 1:1 unless otherwise specified on the drawings.

15.4 PLACEMENT

All foundation excavation and/or preparation shall be completed before placing fill. The fill shall be placed such that the distribution of material is essentially uniform throughout the entire fill and is free from lenses, pockets, streaks, frozen soil or layers of materials differing substantially from surrounding material. No fill shall be placed on a frozen surface.

Equipment weighing 400 pounds or more per foot of width shall not be operated within 2 feet of any structure.

Fill shall be placed in approximately equal horizontal layers. Fill layer thickness before compaction shall not exceed six (6) inches for machine compaction or four (4) inches before compaction for hand-directed power tampers.

15.5 MOISTURE CONTENT

The moisture content at the time of compaction shall be maintained within the limits to prevent dilatancy and bulking. In addition, specified moisture limits using ASTM D-698 may be shown on the drawings.

Fill material shall be brought to the allowable moisture condition before compaction. Material that is too wet or too dry is not allowed as fill material and shall be removed from the site.

If the top surface of a preceding layer or foundation is too dry, the surface shall be scarified and moistened prior to placement of the next layer of fill material.

15.6 COMPACTION

The following is the minimum requirement for common types of compaction equipment. The compaction equipment to be used for the work is specified on the drawing.

(1) Sheepsfoot Roller

The sheepsfoot roller shall weigh 2500 pounds per foot of width and have uniformly spaced 7-inch long tamping feet. The surface area of each layer of fill shall receive a minimum of six passes of the sheepsfoot roller. The maximum speed of the compaction equipment shall be 3 MPH. If wedgefoot or padded drum rollers with shorter tamping feet are used, the maximum thickness of the fill layer shall be less than the length of the teeth or pads.

(2) Pneumatic Rollers

The roller shall exert a force of not less than 60 PSI. The surface area of each layer of fill shall receive a minimum of six passes of the pneumatic roller.

(3) Vibratory Rollers

The roller shall have a minimum weight of 10,000 pounds and have a vibrating frequency of not less than 1000 vibrations per minute. The surface area of each layer of fill shall receive a minimum of six passes of the vibratory roller.

(4) Construction Equipment

The minimum weight of the construction equipment shall be 40,000 pounds and the tracks or wheels shall traverse the entire surface of each layer. The maximum layer thickness shall be 4 inches before compaction.

15.7 STRUCTURES OR CONDUITS

The passage of heavy equipment shall not be allowed over cast-in-place conduits until 14 days after placement of the concrete. The passage of heavy equipment over conduits shall not be allowed until the height of the compacted backfill above the top surface of the conduit equals one-half the clear span width of the conduit, or two (2) feet, whichever is greater.

Compaction of backfill adjacent to structures is governed by Construction Specification CS-17, Structural Backfill.

15.8 TESTING

The moisture content and the compaction of the earthfill may be tested by the NRCS technical representative during placement.